



State of Utah

DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER QUALITY

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Don A. Ostler, P.E.
Executive Secretary

August 4, 1997

Clay Landa
Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

Dear Mr. Landa:

Subject: Transmittal of Renewed Ground Water Quality Discharge Permits, No. UGW450002

Please find enclosed, an executed copy of the Ground Water Quality Discharge Permit for the Reservation Canyon Tailings Impoundment. The Statements of Basis for the permit renewal is also enclosed. This permit has been reissued for an a five year permit term.

The Standard Permit fee for a Ground Water Permit established by the legislature is \$7200. This amount should be sent to the Division of Water Quality, attention Mark Burrell. In order for us continue improving our customer service, we ask that you or a member of your staff fill out and return the enclosed survey. We thank you in advance for your time.

We look forward to working with you to insure a successful closure of the Mercur Mine.

Sincerely,

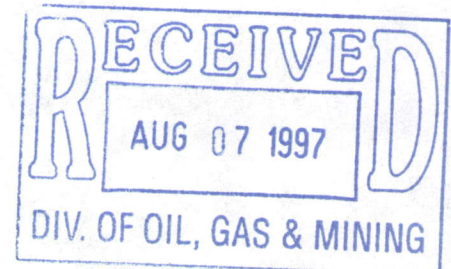
Dennis A. Frederick, P.E.
Ground Water Section Manager

DAF

Enclosure

cc: Mark Burrell, DWQ
Brian Slade, Tooele County Health Dept.
Paul Becket, Utah County Health Dept.
Wayne Hedburg, DOGM

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FILE:PERMIT NO. UGW450002



ADDENDUM TO STATEMENT OF BASIS

June 18, 1997

Barrick Mercur Gold Mine: Reservation Canyon Tailing Impoundment Permit Renewal

Ground Water Quality Discharge Permit No. UGW450002

Basis For Renewal

The permittee has maintained a record of compliance with the conditions of the permit during the permit term that expired June 4, 1997. No adverse effects to ground water, the environment or public health are known to have occurred due to the operation of the tailing impoundment during this period. Barrick will continue to discharge to the tailings impoundment through the end of 1998. Thereafter the focus will turn towards permanent closure of the facilities associated with this permit. This permit is reissued on the basis that 1) the permittee continues to utilize discharge minimization technology including cyanide destruction treatment prior to tailings discharge; 2) all ground water protection levels have been and will continue to be met; 3) the sampling, monitoring and reporting procedures are deemed adequate to determine compliance with the applicable requirements; and 4) there is no expected impairment of present or future beneficial uses of ground water.

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Permit No.: UGW450002

**STATE OF UTAH
DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
P.O. BOX - 16690
SALT LAKE CITY, UTAH 84116-0690**

Ground Water Quality Discharge Permit

In compliance with the provisions of the Utah Water Pollution Control Act, Title 19, Chapter 5, Utah Code Annotated 1953, as amended,

**Barrick Resources (USA) Inc.
Mercur Mine
P.O. Box 838
Tooele, Utah 84074**

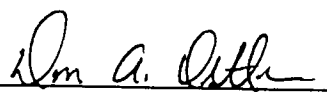
is granted a Ground Water Quality Discharge Permit for the Reservation Canyon Tailings Impoundment located at latitude 40° 20' 00" North, longitude 112° 12' 30" West in accordance with conditions set forth herein.

This modified Ground Water Quality Discharge Permit amends and supersedes all other Ground Water Discharge permits for this facility issued previously.

This modified permit shall become effective on August 4, 1997.

This permit and the authorization to operate shall expire at midnight, August 4, 2002.

Signed this 4th day of August, 1997.



Executive Secretary
Water Quality Board

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I. SPECIFIC CONDITIONS

A. Ground Water Classification

Based on ground water data submitted by the permittee, ground water at the site is generally defined as Class II, with the exception of the aquifer near monitoring well MW-17 which is defined as Class IA.

B. Background Ground Water Quality

1. Background For Monitoring Wells - Based on the chemical characteristics of samples taken since July 1, 1990 from monitoring wells TMW-1, TMW-2, MW-15, MW-16, MW-17 and MW-18 background ground water quality is defined in Table 1.

C. Ground Water Protection Levels

1. Protection Levels for Existing Wells - Ground water quality at monitoring wells TMW-1, TMW-2, MW-15, MW-16, MW-17 and MW-18 shall not exceed the ground water protection levels defined in Table I.
2. Compliance Determination Method - Compliance with ground water protection levels shall be accomplished by the use of six compliance monitoring wells. If future monitoring data indicate an exceedance of protection levels compliance status will be determined in accordance with R317-6.6.17 including if necessary reference to methods described in the EPA Interim Final Guidance Documents entitled "Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities", dated February, 1989 and the July 1992 draft addendum to the Interim Final Guidance. Subsequent updates of this document shall be utilized as available and appropriate.

D. Tailings Treatment and Discharge Minimization Technology

1. Authorized Discharge - During the term of this permit the permittee is authorized to discharge cyanide-detoxified mill tailings to the tailings impoundment using the subareal deposition method. Such discharge shall be subject to the discharge limitations of and monitored in accordance with Table 2 and Part I E 5. The tailings impoundment shall only be used for the following purposes: to dispose of cyanide-detoxified mill tailings; to store, detain and recover storm water runoff from the area immediately surrounding and naturally draining into the tailings impoundment; and to dispose of pretreated domestic waste water. If in order to remain in compliance with the head

Part I
Permit No. UGW450002

TABLE 1 - Compliance Monitoring Well Background and Protection Levels

Parameter	method detecti on limit	ground water quality standard	Monitoring Well TMW-1				Monitoring Well TMW-2				Monitoring Well MW-15			
			Background Level(mg/L)		Protection Level (mg/L)	Compliance Level (mg/L)	Background Level(mg/L)		Protection Level (mg/L)	Compliance Level (mg/L)	Background Level(mg/L)		Protection Level (mg/L)	Compliance Level (mg/L)
			mean	stddev			mean	stddev			mean	stddev		
pH (units)	n/a	6.5-8.5	8.08	n/a	6.5-8.5	6.5-8.5	7.98	n/a	6.5-8.5	6.5-8.5	7.70	n/a	6.5-8.5	6.5-8.5
Arsenic	.01	0.05	ND	n/a	0.013 ^a	0.013	ND	n/a	0.013 ^a	0.013	ND	n/a	0.013 ^a	0.013
Barium	.01	2.0	0.064	0.039	0.5 ^a	0.5	0.037	0.047	0.5 ^a	0.5	0.070	0.019	0.5 ^a	0.5
Cadmium	.002	0.005	ND	n/a	0.002 ^c	0.002	ND	n/a	0.002 ^c	0.002	ND	n/a	0.002 ^c	0.002
Chromium	.01	0.1	ND	n/a	0.025 ^a	0.025	ND	n/a	0.025 ^a	0.025	ND	n/a	0.025 ^a	0.025
Copper	.01	1.3	0.041 ¹	n/a	0.33 ^a	0.33	0.041 ¹	n/a	0.33 ^a	0.33	ND	n/a	0.33 ^a	0.33
Lead	.005	0.015	ND	n/a	0.005 ^c	0.005	ND	n/a	0.005 ^c	0.005	ND	n/a	0.005 ^c	0.005
Mercury	.0002	0.002	ND	n/a	0.0005 ^a	0.0005	ND	n/a	0.0005 ^a	0.0005	ND	n/a	0.0005 ^a	0.0005
Nickel	.01	0.1	ND	n/a	0.025 ^a	0.025	ND	n/a	0.025 ^a	0.025	ND	n/a	0.025 ^a	0.025
Selenium	.002	0.05	ND	n/a	0.013 ^a	0.013	ND	n/a	0.013 ^a	0.013	ND	n/a	0.013 ^a	0.013
Silver	.01	0.1	ND	n/a	0.025 ^a	0.025	ND	n/a	0.025 ^a	0.025	ND	n/a	0.025 ^a	0.025
Thallium	.001	0.002	ND	n/a	0.001 ^c	0.001	ND	n/a	0.001 ^c	0.001	ND	n/a	0.001 ^c	0.001
Zinc	.01	5.0	0.051 ¹	n/a	1.25 ^a	1.25	0.031 ¹	n/a	1.25 ^a	1.25	0.019 ¹	n/a	1.25 ^a	1.25
Cyanide- free	.002	0.2	ND	n/a	0.05 ^a	0.05	ND	n/a	0.05 ^a	0.05	ND	n/a	0.05 ^a	0.05
Fluoride	.1	4.0	1.94	0.15	2.43 ^a	2.43	0.96	0.11	1.20 ^a	1.20	0.31	0.07	1.0 ^a	1.0
Nitrate-N	.02	10.0	0.049	0.128	2.5 ^a	2.5	0.055	0.195	2.5 ^a	2.5	0.110	0.223	2.5 ^a	2.5
Nitrite-N	.005	1.0	0.011 ¹	n/a	0.25 ^a	0.25	0.012 ¹	n/a	0.25 ^a	0.25	0.009	0.006	0.25 ^a	0.25
Sulfate	5.0	n/a	60.5	42.7	monitoring only	n/a	199.2	22.4	monitoring only	n/a	235	22	monitoring only	n/a
TDS	5.0	3000	516	19	645 ^a	645	905	108	1131 ^a	1131	995	54	1244 ^a	1244

1-Background for these parameters was determined by averaging the detectable values since the background data set was greater than 50% non-detect (ND), therefore standard deviation not applicable.

a-Protection Level established based on 1.X times the mean background concentration, where X = 0.25 except for MW-17 where X = 0.10.

b-Protection Level established based on 0.X times the Ground Water Quality Standard, where X = 0.25 except for MW-17 where X = 0.10.

c-Protection Level established at the reported method minimum detection limit.

Part I
Permit No. UGW450002

TABLE 1 (continued)-Compliance Monitoring Well Background and Protection Levels

Parameter	method detection limit	ground water quality standard	Monitoring Well MW-16				Monitoring Well MW-17				Monitoring Well MW-18			
			Background		Protecti on Level (mg/L)	Compliance Level (mg/L)	Background		Protection Level (mg/L)	Compliance Level (mg/L)	Background		Protection Level (mg/L)	Compliance Level (mg/L)
			Level(mg/L)	stddev			Level(mg/L)	stddev			Level(mg/L)	stddev		
pH (units)	n/a	6.5-8.5	7.82	n/a	6.5-8.5	6.5-8.5	7.44	n/a	6.5-8.5	6.5-8.5	7.37	n/a	6.5-8.5	6.5-8.5
Arsenic	.01	0.05	ND	n/a	0.013 ^b	0.013 ^b	ND	n/a	0.01 ^c	0.01 ^c	ND	n/a	0.013 ^b	0.013 ^b
Barium	.01	2.0	0.053	0.046	0.5 ^b	0.5 ^b	0.038	0.007	0.2 ^b	0.2 ^b	0.066	0.058	0.5 ^b	0.5 ^b
Cadmium	.002	.005	ND	n/a	0.002 ^c	0.002 ^c	ND	n/a	0.002 ^c	0.002 ^c	ND	n/a	0.002 ^c	0.002 ^c
Chromium	.01	0.1	ND	n/a	0.025 ^b	0.025 ^b	ND	n/a	0.01 ^b	0.01 ^b	ND	n/a	0.025 ^b	0.025 ^b
Copper	.01	1.3	ND	n/a	0.33 ^b	0.33 ^b	ND	n/a	0.13 ^b	0.13 ^b	ND	n/a	0.33 ^b	0.33 ^b
Lead	.005	0.015	ND	n/a	0.005 ^c	0.005 ^c	ND	n/a	0.005 ^c	0.005 ^c	ND	n/a	0.005 ^c	0.005 ^c
Mercury	.0002	0.002	ND	n/a	0.0005 ^b	0.0005 ^b	ND	n/a	0.0002 ^b	0.0002 ^b	ND	n/a	0.0005 ^b	0.0005 ^b
Nickel	.01	0.1	ND	n/a	0.025 ^b	0.025 ^b	ND	n/a	0.01 ^b	0.01 ^b	ND	n/a	0.025 ^b	0.025 ^b
Selenium	.001	0.05	ND	n/a	0.013 ^b	0.013 ^b	ND	n/a	0.005 ^b	0.005 ^b	ND	n/a	0.013 ^b	0.013 ^b
Silver	.01	0.1	ND	n/a	0.025 ^b	0.025 ^b	ND	n/a	0.01 ^b	0.01 ^b	ND	n/a	0.025 ^b	0.025 ^b
Thallium	.001	0.006	ND	n/a	0.001 ^c	0.001 ^c	ND	n/a	0.001 ^c	0.001 ^c	<.01	n/a	0.001 ^b	0.001 ^b
Zinc	.01	5.0	0.024	n/a	1.25 ^b	1.25 ^b	0.078 ^d	n/a	0.5 ^b	0.5 ^b	0.058	n/a	1.25 ^b	1.25 ^b
Cyanide-free	.02	0.2	ND	n/a	0.05 ^b	0.05 ^b	ND	n/a	0.02 ^b	0.02 ^b	ND	n/a	0.05 ^b	0.05 ^b
Fluoride	.1	4.0	0.26	0.08	1.0 ^b	1.0 ^b	0.15	0.02	0.4 ^b	0.4 ^b	0.17	0.07	1.0 ^b	1.0 ^b
Nitrate-N	.02	10.0	1.11	0.46	2.5 ^b	2.5 ^b	0.47	0.33	1.0 ^b	1.0 ^b	0.52	0.19	2.5 ^b	2.5 ^b
Nitrite-N	.005	1.0	0.011	0.005	0.25 ^b	0.25 ^b	0.007 ^d	n/a	0.1 ^b	0.1 ^b	0.006	n/a	0.25 ^b	0.25 ^b
Sulfate	5.0	n/a	306	28	monitoring only	monitoring only	34	11	monitoring only	monitoring only	183	13	monitoring only	monitoring only
TDS	5.0	3000 or 500	883	62	1104 ^a	1104 ^a	345	30	380 ^a	380 ^a	654	78	818 ^a	818 ^a

1-Background for these parameters was determined by averaging the detectable values since the background data set was greater than 50% non-detect (ND), therefore standard deviation not applicable.

a-Protection Level established based on 1.X times the mean background concentration, where X = 0.25 except for MW-17 where X = 0.10.

b-Protection Level established based on 0.X times the Ground Water Quality Standard, where X = 0.25 except for MW-17 where X = 0.10.

c-Protection Level established at the reported method minimum detection limit.

limitations of Ground Water Quality Discharge Permit No. UGW450001, it becomes necessary to pump area three excess barren solution directly to the tailings impoundment, such flow will be considered a detoxification circuit bypass and will be subject to the bypass provisions of Part I.F.3 and Part III.F. If the excess barren solution does not exceed the maximum daily average discharge limits of Table 2, below, then the flow will not be considered a bypass and will not be subject to the bypass provisions of this permit. All other uses or disposal therein are prohibited without approval of the Executive Secretary. If spills of unauthorized chemicals, fuels or other materials enter the tailings impoundment the permittee shall notify the Executive Secretary within 24 hours and provide written notification within 5 days, in accordance with the requirements of Part II.I.

2. Cyanide Removal - Consistent with the definition of Best Available Technology, R317.6.1.3, Barrick shall operate the INCO SO_2/O_2 tailings treatment system such that maximum practical cyanide-free and cyanide-wad destruction is achieved. Discharge limitations and monitoring requirements are specified in Table 2. Dilution water shall not be added solely to comply with effluent requirements, but is allowed to maintain process slurry design density.

a. Technology Description

The INCO SO_2/O_2 tailings treatment system utilizes sulfur dioxide (SO_2) and oxygen (O_2) gases in the presence of cupric ion (Cu^{2+}) to effect cyanide-free and cyanide-wad destruction. Copper sulfate will be added to provide cupric ion, which acts as the catalyst in the process. This process oxidizes free cyanide (CN^-) and weak acid dissociable cyanide (CN_{WAD}) to cyanate (CNO^-). The cyanate ion is unstable and hydrolyses to carbonate (CO_3^{2-}) and ammonium ion (NH_4^+) in aqueous solution. Maintaining the pH of the tailings feed to the treatment reactor from 8.5 to 9.5 will allow metal ions liberated from their cyanide anions to precipitate as metal hydroxides. Ferricyanide is reduced to ferrocyanide with sulfur dioxide, the ferrocyanide then forms a metallo-ferrocyanide complex which also precipitates. Strong cyanide complexes such as iron cyanide, silver cyanide, gold cyanide and mercury cyanide are not removed by the treatment process. These complexes are generally considered to be more environmentally stable and of lower toxicity than cyanide-free and cyanide-wad. The use of the INCO SO_2/O_2 cyanide destruction process is considered to be appropriate discharge minimization technology commensurate with this existing facility's process design capability.

- b. Performance Standards (See also, Table 2)
- 1) A Maximum Daily Running Average for effluent from the cyanide destruction reactor of 10 mg/l cyanide total and 4 mg/l cyanide-WAD based on the five day average of the six per day grab samples.
 - 2) A Maximum Monthly Average for effluent from the cyanide destruction reactor of 5 mg/l cyanide total and 2 mg/l cyanide-WAD based on the five day average of the six per day grab samples.
 - 3) Barrick may request a variance to the above performance standards when Barrick wants to mill ores with high iron content. The variance request must include information sufficient for the Executive Secretary to evaluate the potential for environmental impact. Such information shall include but is not limited to the expected concentration of cyanide in the effluent, the period of time the variance will be in effect and other pertinent information.
3. Reclaim Water and Lined Containment Ponds - These ponds shall be pumped empty or maintained at the lowest practical water level at all times. The permittee is not authorized to store water in these ponds without approval of the Executive Secretary.
 4. Lined East Bay Reclaim Water Storage Pond - The line facility has a capacity of 60 million gallons. The pond is designed to contain all reclaim water from the tailing pond in order to accelerate the dewatering and drying of the tailing surface in anticipation of closure reclamation. This pond may be used to store reclaim solution during the final 18 months of ore processing and subsequently to allow storage of reclaim solution during the closure activities beyond December 31, 1998.
 5. Lined Chimney Drain Ponds - A regular daily inspection shall be made of the fluid levels in the chimney drain storage ponds. If at any time the fluid levels exceed 1/3 the capacity of these ponds, the fluids contained therein shall be pumped into the tailings impoundment. Pumping shall continue until the ponds are as empty as the pumping system will allow. All pipelines between these ponds and the tailings impoundment shall be properly evacuated following each use to prevent freeze up. The entire pumping system shall be continuously maintained in operable condition.
 6. Spill Containment - Barrick shall utilize best management practices intended

to prevent and contain spills from occurring from any of the following structures: 1) Pipelines between area three and the reclaim water barge, 2) the reclaim water cell, 3) the mill to tailings impoundment slurry line, 4) the slurry line pump box, 5) the tailings impoundment, 6) the CIL floor sump pit, 7) the CIL tailings sump, 8) the concrete lined sedimentation pond and 9) the lined chimney drain storage ponds. The practices shall conform to the following criteria:

- a) Prevent any spills, leakage or overflow from contact with unlined ground surfaces, ground water or surface runoff conveyance systems (ditches, streams, etc).
 - b) Convey all spills or leakage to the concrete lined CIL floor sump, or the CIL tailing sump, the tailing impoundment, the concrete lined sedimentation pond or new containment mechanisms approved by the Executive Secretary.
 - c) The tailing impoundment facility shall be constructed and operated in accordance with standards and regulations established by the Utah Division of Water Rights and Dam Safety.
7. Tailings Impoundment Design and Construction - New construction of the tailings impoundment structures and impoundment bottom liner shall be according to the design and methods approved in the Construction Permit issued annually by the Division of Water Quality.
- a) Construction Permit Authorization - The tailings impoundment was originally constructed by the authority of the April 27, 1982 construction permit. This permit authorized Barrick to utilize a bentonite enriched bottom liner and build containment structures up to an elevation of 7,260 feet above mean sea level. In a August 12, 1992 Conditional Finding of Insignificant Modification Barrick was allowed to further enlarge this facility to an elevation of 7,270 feet. Barrick is currently approved by the Division of Water Quality to build confinement structures to an elevation of 7305 feet above sea level and impoundment liner to an elevation of 7320 feet above sea level.
 - b) Pond Liner Requirement - Impoundment bottom liner built from the original execution date of this permit will have an in place maximum permeability of 1×10^{-7} cm/sec and shall be built in accordance with

the conditions of the annual construction permit.

- c) Monitoring Wells - Monitoring well construction shall conform to A Guide to the Selection of Materials for Monitoring Well Construction (1983) and RCRA Groundwater Monitoring Technical Enforcement Guidance Manual (1986). Steel casing or other suitable material when approved by the Executive Secretary shall be required on all new wells constructed for the purposes of this permit.

E. Compliance Monitoring Requirements

1. Quality Assurance Project Plan - All water quality monitoring to be conducted under this permit shall be conducted in accordance with the general requirements, hereunder, and the specific requirements of Quality Assurance Project Plan, dated November 29, 1996, attached as Appendix A to this permit.
2. Compliance Monitoring Wells - The permittee has installed six monitoring wells at the tailing impoundment site. All six wells will be used as compliance monitoring points. The locations of these wells are described below.
 - a) Compliance Monitoring Well TMW-1 - NE/4 OF SE/4 of NE/4 of section 5 T. 6 S. R. 3 W 150 ft. west, 1470 ft. south of NE corner.
 - b) Compliance Monitoring Well TMW-2 - NE/4 of SE/4 of NE/4 of section 5 T. 6 S. R. 3 W. 170 ft. west, 1670 ft. south of NE corner.
 - c) Compliance Monitoring Well MW-15 - SE/4 of SW/4 of SE/4 of section 32 T. 5 S. R 3 W. 1750 ft. west, 140 ft. north of SE corner.
 - d) Compliance Monitoring Well MW-16 - NE/4 of NE/4 of NE/4 of section 5 T. 6 S. R. 3 W. 410 ft. west, 40 ft. south of NE corner.
 - e) Compliance Monitoring Well MW-17 - State plane coordinates 728,844.51 N., 1,807,822.13 W.
 - f) Compliance Monitoring Well MW-18 - State plane coordinates 729,671.55 N., 1,806,786.28 W.
3. Protection of Monitoring Well Network - All compliance monitoring wells

must be protected from damage due to surface vehicular traffic or contamination due to surface spills. They shall be maintained in full operational condition for the life of this permit. Any well that becomes damaged beyond repair or is rendered unusable for any reason will be replaced by the permittee within 90 days or as directed by the Executive Secretary.

4. Ground Water Quality Monitoring Frequency and Procedure Requirements

- a) Ground Water Level Measurements - Ground water level measurements shall be made in each monitoring well prior to any collection of ground water samples. These measurements will be made from a permanent single reference point clearly demarcated on the top of the well or surface casing. Measurements will be made to the nearest 0.01 foot.
- b) Ground Water Monitoring Frequency - groundwater measurements and analysis shall be conducted on a semi-annual basis for all six monitoring wells. Semi-annual monitoring will be conducted during the first and third quarters during odd numbered years and during the second and forth quarters during even numbered years. Monitoring will be reported to the Executive Secretary as per the requirements stipulated in Part I.G.1.
- C) Ground Water Quality Sampling - grab samples of ground water from all compliance monitoring wells will be collected for chemical analysis, in conformance with the Quality Assurance Project Plan that has been approved by the Executive Secretary, Part I.H.1.
 - 1) Analysis by Certified Laboratories - analysis of any ground water sample shall be performed by laboratories certified by the State Health Laboratory.
 - 2) Ground Water Analytical Methods - methods used to analyze ground water samples must comply with the following:
 - i) Are methods cited in UAC R317-6-6.3A(13), and
 - ii) Have detection limits which are less than or equal to the ground water protection levels found in Part I C, Table 1. In the case of cadmium, cyanide (total) and

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nickel, the detection limits shall be less than or equal to 0.002 mg/l, 0.02 mg/l and 0.015 mg/l, respectively.

- 3) Analysis Parameters - the following analyses will be conducted on all ground water samples collected:
- i) Field Parameters - pH, temperature, and specific conductance
 - ii) Laboratory Parameters - including:
 - Major Anions and Cations: including chloride, sulfate, carbonate, bicarbonate, sodium, potassium, magnesium and calcium.
 - Protection Level Parameters - found in Table 1 of Part I C, above.
 - Weak Acid Dissociable Cyanide
 - Cyanide Amenable to Chlorination
 - Cyanide Degradation Products, including: ammonia and nitrite.
5. Effluent Monitoring Frequency and Reporting Requirements - Instantaneous grab samples shall be taken for dissolved iron and picric-WAD cyanide determinations at the reactor vessel discharge. All 8 hour total water chemistry composite compliance effluent samples will be taken at the tailings impoundment discharge point(s) approved by the Executive Secretary. For compliance determination purposes all 8 hour composite samples will be considered daily averages. No mixing with standing tailings impoundment water shall be allowed. Samples may be filtered or allowed to settle as necessary, but contact with the atmosphere shall be kept to a minimum. Monitoring, sample handling, and analysis shall be performed in accordance with the Quality Assurance Project Plan Appendix A.
- (a) The "daily average" means the arithmetic average of all the daily instantaneous grab samples made during a calendar day. Instantaneous grab samples are obtained a minimum of 6 per day on a 4-hr sampling frequency, the average of which are recorded on the daily operator sheets.
 - (b) The "monthly average" concentration means the arithmetic average of the daily average determinations of each calendar day for a

particular calendar month.

- (c) An "8-hr composite sample" shall consist of at least three (3) grab samples taken within an 8 hour period which is representative of the end-of-pipe discharge. This sample shall be considered a daily average sample for compliance determination purposes.
 - (d) Continuous flow measurements shall be performed by a direct flow measurement technique such as a flow meter, weir or gage equipped with an electrical recording device.
 - (e) Average daily determinations are required for pH, cyanide-WAD, total cyanide and total iron. These values will be reported daily on the daily operator log sheet.
6. Reclaim Water Monitoring - Barrick shall monitor the tailings impoundment reclaim water at the barge as approved in the Quality Assurance Project Plan. The surface water monitoring frequency shall be monthly for all the parameters of Table 2, below, and Part I E 4(b)(3). All tailings impoundment sampling shall be conducted in accordance with the Quality Assurance Project Plan, Appendix A.

F. Non-Compliance Status

1. Probable Out-of-Compliance Based on Exceedance of Ground Water Protection Limits

Barrick shall evaluate the results of each round of ground water sampling and analysis to determine any exceedance of the ground water protection levels found in Table 1 . Upon determination by Barrick that the data indicate a ground water protection level may have been exceeded at any downgradient compliance monitoring well, Barrick shall:

- a) Immediately resample the monitoring well(s) found to be in probable out-of-compliance, for the protection level parameters that have been exceeded. Submit the analytical results thereof, and notify the Executive Secretary of the probable out-of-compliance status within 30 days of the initial detection.
- b) Immediately implement an accelerated schedule of monthly ground water sampling and analysis, consistent with the requirements of Part I E 4(b). This monthly sampling will continue for at least two months or until the compliance status can be determined by the Executive Secretary. Reports of the results of this sampling will be submitted to the Executive Secretary as soon as they are available, but not later than 30 days from each date of sampling.

Table 2
Effluent Monitoring

Parameters	Discharge Limits		Monitoring Requirements	
	Maximum Daily Average (a)	Maximum Monthly Average (b)	Measurement Frequency	Sample Type
Flow	n/a	n/a	Continuous	(I.E.5.d.)
pH	8-10 units	8-10 units	6/day (c)	grab
pH	8-10 units	8-10 units	2/month (d)	8 hr composite
Cyanide - WAD	4 mg/L	2 mg/L	6/day (c,e)	grab
Cyanide - Total	10 mg/L	5 mg/L	6/day (c,f)	grab
Iron-D	n/a	n/a	6/day (c,e)	grab
Iron-T	n/a	n/a	monthly (d)	8hr composite
Ammonia	n/a	n/a	monthly (d)	8hr composite
Nitrate	n/a	n/a	monthly (d)	8hr composite
Nitrite	n/a	n/a	monthly (d)	8hr composite
Sulfate	n/a	n/a	monthly (d)	8hr composite
TDS	n/a	n/a	monthly (d)	8hr composite
Arsenic	n/a	n/a	monthly (d)	8hr composite
Barium	n/a	n/a	monthly (d)	8hr composite
Cadmium	n/a	n/a	monthly (d)	8hr composite
Chromium	n/a	n/a	monthly (d)	8hr composite
Copper	n/a	n/a	monthly (d)	8hr composite
Lead	n/a	n/a	monthly (d)	8hr composite
Mercury	n/a	n/a	monthly (d)	8hr composite
Nickel	n/a	n/a	monthly (d)	8hr composite
Selenium	n/a	n/a	monthly (d)	8hr composite
Silver	n/a	n/a	monthly (d)	8hr composite
Zinc	n/a	n/a	monthly (d)	8hr composite

(a) 5-day running average of daily average (current day and four previous days)

(b) monthly average of daily average

(c) onsite analysis

(d) certified outside laboratory

(e) picric acid method

(f) calculated by following equation: $CN-T = CN-WAD + (2.795 * [Fe])$

2. Out-of-Compliance Status Based on Confirmed Exceedance of Permit Ground Water Protection Limits

a) Out of Compliance Status shall be defined as follows:

- 1) For parameters that have been defined as detectable in the background and for which protection levels have been established based on 1.25 or 1.10 times the mean background concentration, out-of-compliance shall be determined by the use of control charts for intra-well comparisons in accordance with an EPA document entitled "Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities", February, 1989. Any other compliance monitoring or statistical method used by Barrick must receive prior approval from the Executive Secretary.
- 2) For parameters that have been defined as detectable in the background and for which protection levels have been established based on 0.25 times the ground water quality standard, out-of-compliance shall be defined as 2 consecutive samples exceeding the protection level and the mean background concentration by two standard deviations.
- 3) For parameters that have background data sets between 50-85% non-detectable analyses, out-of-compliance shall be defined as 2 consecutive samples from a compliance monitoring point exceeding the established protection level.
- 4) For parameters that have been defined non-detectable in the background and for which protection limits have been determined based on 0.25 or 0.10 times the ground water quality standard or the limit of detection out-of-compliance shall be defined as 2 consecutive samples from a compliance monitoring point exceeding the established protection limit.

b) Notification and Accelerated Monitoring - upon determination by the permittee or the Executive Secretary, in accordance with UAC R317-6-6.17, that an out-of-compliance status exists, the permittee shall:

- 1) Verbally notify the Executive Secretary of the out-of-compliance status or acknowledge Executive Secretary notice that such a status exists within 24 hours, and
- 2) Provide written notice within 5 days of the determination, and
- 3) Continue an accelerated schedule of monthly ground water monitoring for at least two months and continue monthly monitoring until the facility is brought into compliance.

- c) Source and Contamination Assessment Study Plan - within 30 days of the verbal notice to the Executive Secretary required in Part I F 2(b), above, the permittee shall submit an assessment study plan and compliance schedule for:
 - 1) Assessment of the source or cause of the contamination, and determination of steps necessary to correct the source.
 - 2) Assessment of the extent of the ground water contamination and any potential dispersion.
 - 3) Evaluation of potential remedial actions to restore and maintain ground water quality, and ensure that the ground water standards will not be exceeded at the compliance monitoring wells.
- 3. Out-of-Compliance Status Based Upon Failure To Maintain Discharge Minimization Technology

In the event the permittee fails to maintain the Detoxification Circuit in compliance with permit effluent limits or fails to meet any of the requirements of Part I.D, of this permit, the permittee shall submit to the Executive Secretary a notification and description of the failure in accordance with Part II I.1 and 2. Detoxification Circuit failures less than 24-hours in duration will only require oral notification and documentation on operator's reports in accordance with provisions Part II I.1, unless a written submission pursuant to Part II I.2 is required by the Executive Secretary.

G. Reporting Requirements

- 1. Ground Water Monitoring Report:
 - a) Schedule - The sampling and analysis required in Part I E 5, above, shall be reported according to Table 3, below.

Table 3 Compliance Monitoring Reporting Schedule

<u>Quarter</u>	<u>Report Due On</u>
1st (Jan., Feb., March)	April 15
2nd (April, May, June)	July 15
3rd (July, Aug., Sept.)	October 15
4th (Oct., Nov., Dec.)	January 15

b). Sampling and Analysis Report - will include:

- 1) Field Data Sheets - or copies thereof, including the field measurements, required in Part I E 4(b)(3), above, and other pertinent field data, such as: well name/number, date and time, names of sampling crew, type of sampling pump or bail, measured casing volume, volume of water purged before sampling.
- 2) Results of Ground Water Analysis - including date sampled, date received, ion balance; and the results of analysis for each parameter, including: value or concentration, units of measurement, reporting limit (minimum detection limit for the examination), analytical method, and the date of the analysis.
- 3). Ground Water Level Measurements - water level measurements from ground water monitoring wells will be reported in both measured depth to ground water and ground water elevation above mean sea level.
- 4) Electronic Filing Requirements - In addition to submittal of the hard copy data, above, the permittee is requested to electronically submit the required ground water monitoring data in an electronic format approved by the Executive Secretary. The data may be sent by e-mail, floppy disc, modem or other approved transmittal mechanism.

2. Best Available Technology Report:

- a) Schedule - The Best Available Technology monitoring, sampling and analysis required under Part I.E shall be summarized on a monthly basis and reported to the Executive Secretary in accordance with the Compliance Monitoring Schedule of Table 3.
- b) Effluent Monitoring - Reporting of the Effluent Monitoring required in Part I.D.4 will include:

- 1) The daily average pH, cyanide-WAD, dissolved iron and calculated cyanide-total values.
 - 2) The daily five day running average for cyanide-WAD and cyanide-total values.
 - 3) The monthly average of the daily average pH, cyanide-WAD, dissolved iron and calculated cyanide-total values.
 - 4) The monthly maximum of the daily average pH, cyanide-WAD, dissolved iron and calculated cyanide-total values.
 - 5) The monthly 8-hr composite sample for the parameters of Table 2 and the parameters of Part I.E.4.b.3.
 - 6) The daily quantity of flow to the tailings impoundment.
- c. Reclaim Monitoring - Reporting of the Reclaim Monitoring required in Part I.D.5 will include:
- 1) The monthly grab sample for the parameters of Table 2 and the parameters of Part I.E.4.b.3.
- d. Electronic Filing Requirements - In addition to submittal of the hard copy data, above, the permittee is requested to electronically submit the monthly laboratory analysis of the Effluent and Reclaim Water Monitoring in an electronic data format approved by the Executive Secretary. The data may be sent by e-mail, floppy disc, modem or other approved transmittal mechanism.

H. Compliance Schedule

1. Quality Assurance Project Plan - The water quality sampling, handling and analysis plan, Appendix A of the permit, shall be updated and/or modified as required by the Executive Secretary. The revised plan will be submitted for Executive Secretary approval, within 45 days following receipt of notice from the Executive Secretary, that updates or revisions to the plan are required. The revised document will replace the current Appendix A and is hereby incorporated by reference.
2. Final Closure Plan - In the event that the permittee decides to discontinue its operations at the facility the permittee shall notify the Executive Secretary of such a decision and submit a Final Closure Plan within 180 days. The Final Closure Plan shall be submitted no later than 180 days prior to the closure of the tailings impoundment facility. The permittee shall resubmit Final

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Closure Plans within 60 days of receipt of written notice of deficiencies therein. Any material changes made to this plan, after it receives Executive Secretary approval, shall also require approval of the Executive Secretary. Said closure plans will require a construction permit in addition to approval under this permit.

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

- A. Representative Sampling. Samples taken in compliance with the monitoring requirements established under Part I shall be representative of the monitored activity.
- B. Analytical Procedures. Water sample analysis must be conducted according to test procedures specified under UAC R317-6.3.A.13, unless other test procedures have been specified in this permit.
- C. Penalties for Tampering. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- D. Reporting of Monitoring Results. Monitoring results obtained during each reporting period specified in the permit, shall be submitted to the Executive Secretary, Utah Division of Water Quality at the following address no later than the 15th day of the month following the completed reporting period:
- State of Utah
Division of Water Quality
Department of Environmental Quality
Salt Lake City, Utah 84114-4810
Attention: Ground Water Protection Section
- E. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.
- F. Additional Monitoring by the Permittee. If the permittee monitors any pollutant more frequently than required by this permit, using approved test procedures as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated.
- G. Records Contents. Records of monitoring information shall include:
1. The date, exact place, and time of sampling or measurements;
 2. The individual(s) who performed the sampling or measurements;
 3. The date(s) and time(s) analyses were performed;
 4. The individual(s) who performed the analyses;
 5. The analytical techniques or methods used; and,

6. The results of such analyses.

H. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time.

I. Twenty-four Hour Notice of Noncompliance Reporting.

1. The permittee shall verbally report any noncompliance with permit conditions or limits as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The report shall be made to the Utah Department of Environmental Quality 24 hour number, (801) 538-6333, or to the Division of Water Quality, Ground Water Protection Section at (801) 538-6146, during normal business hours (8:00 am - 5:00 pm Mountain Time).
2. A written submission of any noncompliance with permit conditions or limits shall be provided to the Executive Secretary within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:
 - a. A description of the noncompliance and its cause;
 - b. The period of noncompliance, including exact dates and times;
 - c. The estimated time noncompliance is expected to continue if it has not been corrected; and,
 - d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
 - e. When applicable, either an estimation of the quantity of material discharged to the tailings impoundment or an estimation of the quantity of material released outside containment structures.
3. Written reports shall be submitted to the addresses in Part II D, Reporting of Monitoring Results.

J. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours, shall be reported at the time that monitoring reports for Part II D are submitted.

- K. Inspection and Entry. The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
 2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,
 4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

- A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of the Utah Water Quality Board of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- B. Penalties for Violations of Permit Conditions. The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine not exceeding \$25,000 per day of violation. Any person convicted under Section 19-5-115(2) of the Act a second time shall be punished by a fine not exceeding \$50,000 per day. Nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.
- C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
- E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
- F. Bypass of Treatment Facilities
1. Definitions:
 - a. "Bypass" means the intentional diversion of tailings from any portion of the treatment system or untreated flow through the system during a partial system failure.

- b. "Severe property damage" means substantial physical damage to property, damage to treatment facilities which may cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- 2. Bypass not Exceeding Discharge Limitations - The permittee may allow any bypass to occur which does cause effluent limitations to be exceeded, but only if it is also for essential maintenance of the treatment system to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 3, 4 and 5 of this Section.
 - 3. Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice, at least five (5) days before the date of the bypass. The notice shall include the reason(s) for the anticipated bypass, the expected length of time treatment systems will be bypassed, and a description of the measures taken to mitigate the quantities released during the bypass. Operational records shall be submitted following the anticipated bypass detailing the quantities of materials released and the levels of relevant chemical constituents in the materials released. The permittee shall limit the time period of the bypass to the minimum amount of time necessary to affect system maintenance or repairs.

The Executive Secretary may approve an anticipated bypass, after considering any potential effects, if the Executive Secretary determines that it will meet the three conditions listed in paragraph 5 below of this section.
 - 4. Unanticipated Bypass - The permittee shall submit notice of an unanticipated bypass as required in Part I F 3. The permittee shall limit the time period of the bypass to the minimum amount of time necessary to affect system maintenance or repairs.
 - 5. Prohibition of Bypass - Bypass is prohibited and the Executive Secretary may take enforcement action against a permittee for a bypass, unless:
 - a) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of

equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,

- c) The permittee submitted notices as required under Part III F.3, above.

G. Affirmative Defense

In the event that a compliance action is initiated against the permittee for violation of permit conditions relating to discharge minimization technology, the permittee may affirmatively defend against that action by demonstrating the following:

1. The permittee submitted notification according to Part I.F.3 and Part II.I.1 and 2;
2. The failure was not intentional or caused by the permittee's negligence, either in action or in failure to act;
3. The permittee has taken adequate measures to meet permit conditions in a timely manner or has submitted to the Executive Secretary, for the Executive Secretary's approval, an adequate plan and schedule for meeting permit conditions; and
4. The provisions of 19-5-107 have not been violated.

IV. GENERAL REQUIREMENTS

- A. Planned Changes. The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.
- B. Anticipated Noncompliance. The permittee shall give advance notice of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- C. Spill Reporting - The Permittee shall immediately report as per UCA 19-5-114 of the Utah Water Quality Act any spill or leakage from the tailings impoundment or associated facilities which is not totally contained by a collection system. This report shall be made to the phone numbers given in Part II I 1. A written report will be required within 5 days-of the occurrence and should address the requirements of UCA 19-5-114 and Part II I 2 and 3 of this permit.
- D. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- E. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a permit renewal or extension. The application should be submitted at least 180 days before the expiration date of this permit.
- F. Duty to Provide Information. The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.
- G. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Executive Secretary, it shall promptly submit such facts or information.

H. Signatory Requirements. All applications, reports or information submitted to the Executive Secretary shall be signed and certified.

1. All permit applications shall be signed as follows:
 - a. For a corporation: by a responsible corporate officer;
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
 - c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
2. All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
3. Changes to Authorization. If an authorization under Part IV H 2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV H 2. must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the

information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- I. Penalties for Falsification of Reports. The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- J. Availability of Reports. Except for data determined to be confidential by the permittee, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Executive Secretary. As required by the Act, permit applications, permits, effluent data, and ground water quality data shall not be considered confidential.
- K. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
- L. Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
- M. Transfers. This permit may be automatically transferred to a new permittee if:
 - 1. The current permittee notifies the Executive Secretary at least 30 days in advance of the proposed transfer date;
 - 2. The notice includes a written agreement between the existing and new permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,
 - 3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement as described in Part IV.M.2, above.
- N. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, penalties established pursuant to any applicable state law or regulation under

authority preserved by Section 19-5-117 of the Act.

- O. Reopener Provisions. This permit may be reopened and modified pursuant to R317-6-6.6.B or R317-6-6.10.C to include the appropriate limitations and compliance schedule, if necessary, if one or more of the following events occurs:
1. If new ground water standards are adopted by the Board, the permit may be reopened and modified to extend the terms of the permit or to include pollutants covered by new standards. The permittee may apply for a variance under the conditions outlined in R317-6-6.4.D.
 2. Changes have been determined in background ground water quality.

APPENDIX A - WATER QUALITY MONITORING

QUALITY ASSURANCE PROJECT PLAN

Dated November 29, 1996